R. CHASE CORNELISON, Ph.D.

Postdoctoral Research Associate
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EDUCATION

B.S., 2011 — **Summa Cum Laude, Chemical and Biomolecular Engineering**, the University of Tennessee, Knoxville, Knoxville, TN

Ph.D., 2015 — **Chemical Engineering, The University of Texas at Austin**, Austin, TX
Dissertation: *Injectable acellular nerve graft as a platform for treating spinal cord injury*

RESEARCH AND TEACHING EXPERIENCE

Sept. 2017 – **Course Development, Virginia Polytechnic Institute and State University**
Frontiers in Cancer Engineering, to be taught by Dr. Jennifer Munson
Co-developing a cancer engineering course emphasizing the importance of international collaboration with a component of international travel (Switzerland)

Jan. 2017 – May 2017 **Co-Instructor, University of Virginia**
Integrative Design and Experimental Analysis lab (BME 3090)
Delivered lectures and directed laboratory classes on mass transport and cell migration in tissue engineering | Mentored a team of students exploring the effects of cell density on mass transport limitations in tissue

Oct. 2016 **Guest Lecturer on Immunoengineering, University of Virginia**
Tissue Engineering (BME 4417)
Developed and delivered a lecture to upper level biomedical engineering undergraduates covering engineering strategies to modify the immune system

Sept. 2015 – Present **Postdoctoral Associate, University of Virginia/Virginia Polytechnic Institute**
Advisor: Dr. Jennifer M. Munson, *Oncoengineering Lab*
Defining and targeting the effects of interstitial fluid flow in the glioblastoma tumor microenvironment | Contributed writing to a successfully funded R01

July 2014 **Guest Lecturer, University of Florida**
Student Science Training Program
Engaged ~90 high school students on topics in biomedical engineering

Aug. 2012 – Dec. 2012 **Graduate Teaching Assistant, The University of Texas at Austin**
Fundamentals of engineering lab course (ChE 253M)
Lead small groups of chemical engineering undergraduate students on the fundamentals of statistical process control and graded weekly laboratory reports

Aug. 2011 – Aug. 2015 **Graduate Research Assistant, The University of Texas at Austin**
Advisor: Dr. Christine E. Schmidt, *Biomimetic Materials and Neural Engineering Lab*
Developed and characterized a thermoresponsive biomaterial derived from acellular nervous tissue; assessed in a rodent model of contusion spinal cord injury | Developed a novel, apoptosis-based decellularization method for enhanced tissue preservation | Resulted in funding of new grants through the NSF and Conquer Paralysis Now Foundation | Individual F31 scored, not awarded

AWARDS & HONORS

- Best Poster Award, UVA Graduate Biomedical Engineering Society Fall Symposium (2016)
- National Science Foundation travel award (2015)
- Temple Foundation Graduate Fellowship Fund (2014)
- Larry Holmes Endowed Presidential Scholarship in Chemical Engineering (2012)
- Engineering Foundation Endowed Graduate Presidential Scholarship (2011)
- American Chemical Society's Most Outstanding Senior Award (2011)
- National Math and Science Talent Grant (2010)
- Chancellor's Honors Program Senior Thesis Research Grant (2010)
- National Math and Science Talent Grant (2009)

PUBLICATIONS AND PATENTS

1. **Cornelison RC**, Wellman SW, Park JH, Porvasnik SL, Song YH, Wachs RA, Schmidt CE (2018). *Development of an apoptosis-assisted decellularization method for maximal preservation of nerve tissue structure.* Acta Biomaterialia, 1.77: 116-126. PMID: 29981947. *Featured by Science Magazine*.
2. Da Mesquita S, Louveau A, Vaccari A, Smirnov I, **Cornelison RC**, Kingsmore KM, Contarino C, Onengut-Gumuscu S, Farber E, Raper D, Viar KE, Baker W, Dabhi N, Oliver G, Rich S, Munson JM, Overall CC, Acton ST, Kipnis J (2018). *Functional aspects of meningeal lymphatics in aging and Alzheimer's disease.* Nature, 560.7717: 185. PMID: 30046111. *Featured on journal cover*.

3. Cerqueira SR, Lee YS, **Cornelison RC**, Mertz MW, Wachs RA, Schmidt CE, Bunge MB (2018). *Decellularized nerve matrix supports Schwann cell transplants and axon growth following spinal cord injury*. Biomaterials, 177: 176-185. PMID: 29929081.
4. **Cornelison RC** and Munson JM (2018). *Perspective on translating biomaterials into glioma therapy: Lessons from* in vitro *models.* Frontiers in Materials, 5: 27.
5. **Cornelison RC**, Gonzalez-Rothi EJ, Porvasnik SL, Wellman SM, Park JH, Fuller DD, Schmidt CE (2018). *Injectable hydrogels of optimized acellular nerve for injection into the injured spinal cord.* Biomedical Materials, 13.3: 034110. PMID: 29380749.
6. Schmidt CE, Wachs RA, **Cornelison RC** (2017). *Tissue Decellularization Methods*. US Patent App. 15/744,942.
7. Hardy JG, **Cornelison RC**, Sukhavasi RC, Saballos RJ, Vu P, Kaplan DL, and Schmidt CE (2015). *Electroactive tissue scaffolds with aligned pores as instructive platforms for biomimetic tissue engineering*. Journal of Bioengineering, 2.1: 15-34. PMID: 28955011. *Top 3 cited article in the journal as of 2018*.
8. Hardy JG, Geissler SA, Aguilar Jr. D, Villancio-Wolter MK, Mouser DJ, Sukhavasi RC, **Cornelison RC**, Tien LW, Preda RC, Hayden RS, Chow JK, Nguy L, Kaplan DL, Schmidt CE (2015). *Instructive conductive 3D silk foam-based bone tissue scaffolds enable electrical stimulation of stem cells for enhanced osteogenic differentiation*. Macromolecular Bioscience, 15.11: 1490-1496. PMID: 26033953.

PENDING PUBLICATIONS

1. **Cornelison RC**, Brennan CE, Munson JM. *Convective forces increase CXCR4-dependent glioblastoma cell invasion in GL261 murine model. (revisions submitted to Scientific Reports)*
2. Brooks EA*, Galarza S*, Gencoglu MF*, **Cornelison RC**, Munson JM, Peyton SR. Applicability of Drug Response Metrics for Cancer Studies using Biomaterials. *(under review at Philosophical Transactions B; available at https://www.biorxiv.org/content/early/2018/09/07/408583) *Equal contributions*
3. Yuan JX*, **Cornelison RC***, Kalkunte NG, Tate KM, Munson JM. A patient-designed model of the invasive glioblastoma tumor microenvironment. *(in preparation) *Equal contributions*
4. Wachs RA, Wellman SM, Porvasnik SL, Lakes E, **Cornelison RC**, Song YH, Allen KD, Schmidt CE. *Functional characterization of apoptosis-decellularized nerve grafts in a rat sciatic nerve injury model. (in preparation)*

PROFESSIONAL SERVICE

Aug. 2016 –	Manuscript Peer Reviewer *Review manuscripts for publication (e.g., J Neural Eng and J Tissue Eng and Regen Med)*
Aug. 2016 – May 2017	Grant Review Member, Intramural Postdoctoral New Horizons Travel Awards *Reviewed and selected successful applications for a postdoctoral travel award*
Aug. 2015 – May 2016	Capstone Team Mentor, Department of Biomedical Engineering *Guided project development/experimental details, defined metrics for success, outlined tangible weekly goals, and oversaw writing of the thesis document*
Sept. 2009 – May 2011	Chemical Engineering Undergraduate Academic Advisory Committee, Knoxville, TN *Communicated concerns or ideas from junior and senior level chemical engineering students to the department administration*

PUBLIC OUTREACH ACTIVITIES

April 2017 – May 2017	Poster Judge, University of Virginia Engineering Research Symposium and Virginia Piedmont Regional Science Fair *Engaged young scholars in scientific discussion; scored exhibitions based on set criteria*
Jan. 2017 – Aug. 2017	Volunteer, Virginia Discovery Museum, Charlottesville, VA *Encouraged self-exploration and discovery through hands-on science and engineering exhibits during weekly shifts*
Aug. 2011 –	Outreach Volunteer, various primary schools and organizations *Lead science demonstrations with local school-age children in lab and classroom settings*

STUDENTS SUPERVISED

Aug. 2018 –	Kinsley Tate, Ph.D. Student, Virginia Tech
June 2018 – July 2018	Beulah Dadala, REU student, University of California, Berkeley
Aug. 2016 – May 2017	Caroline Brennan, Undergraduate Student, University of Virginia
Aug. 2015 – May 2016	Alex Berr, Undergraduate Capstone Team, University of Virginia *Pursuing a Ph.D. at Northwestern*
Aug. 2015 – May 2016	Ossman Cassio, Undergraduate Capstone Team, University of Virginia *Masters at Georgia Tech, now the Clinical Account Specialist at Biosense Webster*
Aug. 2015 – May 2015	Nick Asby, Undergraduate Student, University of Virginia *Pursing graduate studies at the University of Chicago*
Sept. 2013 – Aug. 2015	Jay Park, Undergraduate Student, University of Florida *Pursuing an M.D. at the University of Florida*
Sept. 2013 – Aug. 2015	Steven Wellman, Undergraduate Student, University of Florida *Pursing a Ph.D. at the University of Pittsburgh*

PROFESSIONAL AND ACADEMIC SOCIETIES

- Society for NeuroOncology, Member (2017 – Present)
- Biomedical Engineering Society, Member (2015 – Present)
- Society for Biological Engineering, Member (2014 – Present)
- Society for Biomaterials, Member (2014 – 2016)
- TN-α Tau Beta Pi Engineering Honors Society (2009 – Present)
- American Institute of Chemical Engineers, Member (2008 – Present)

PRESENTATIONS

1. **Cornelison RC**, Yuan JX, Brennan CE, Munson JM (poster). *Shear stress and interstitial fluid flow modulate glial cell-mediated chemotaxis of glioma*. Society for NeuroOncology in San Francisco, CA, November 17-19, 2017.
2. **Cornelison RC**, Yuan JX, Horton BJ, Munson JM (podium). *Glial cell analysis in the brain tumor microenvironment elucidates contributions to glioblastoma patient progression.* Summer Biomechanics, Bioengineering and Biotransport Conference (SB^3C) in Tucson, AZ, June 2017.
3. Da Mesquita S, Louveau A, Smirnov I, **Cornelison RC**, Viar KE, Munson JM, Kipnis J (poster). *Deciphering the role of the meningeal lymphatics in brain aging and in Alzheimer's disease pathogenesis.* XV Meeting of the Portuguese Society for Neuroscience in Braga, Portugal, May 2017.
4. **Cornelison RC**, Kingsmore KM, Brennan CE, Munson JM (poster). *Invasion of GL261 cancer cells in vivo is regulated by interstitial flow and depends on CXCR4 signaling*. University of Virginia GBMES Symposium (best poster award) and Biomedical Engineering Society in Minneapolis, MN, October 2016.
5. **Cornelison RC**, Munson JM (podium). *Interactions of interstitial flow with the glioma microenvironment*. Central Virginia Chapter of Society for Neuroscience in Charlottesville, VA, March 2016.
6. **Cornelison RC**, Park JH, Wachs RA, Wellman SM, Schmidt CE (poster). *Harnessing apoptosis for enhanced tissue preservation during decellularization*. UF Biomaterials Day in Gainesville, FL, March 2016.
7. **Cornelison RC**, Park JH, Schmidt CE (poster and rapid fire podium). *Injectable Acellular Nerve Hydrogels to Promote Spinal Cord Regeneration*. Regenerative Medicine Workshop in Hilton Head, SC, May 2015.
8. Wachs RA, **Cornelison RC**, Xin S, Schmidt CE. *Development of a Proteoglycan Rich Matrix for Nucleus Pulposus Regeneration*. Regenerative Medicine Workshop in Hilton Head, SC, May 2015.
9. Wachs RA, Hyyti A, **Cornelison RC**, Schmidt CE. *Development of a Tissue Specific Acellular Extracellular Matrix for Intervertebral Disc Regeneration Using a Gentle Decellularization Process*. Society for Biomaterials in Charlotte, NC, April 2015.
10. **Cornelison RC**, Schmidt CE (poster). *Injectable Acellular Nerve Hydrogels for Treating Spinal Cord Injury*. UF's College of Medicine Celebration of Research Week in Gainesville, FL, February 2015.
11. **Cornelison RC**, Nguyen V, Schmidt CE (podium). *Peripheral Nerve Extracellular Matrix Hydrogels for Treating Spinal Cord Injury*. American Institute of Chemical Engineers annual meeting in Atlanta, GA, November 2014.
12. **Cornelison RC**, Schmidt CE (poster). *Extracellular Matrix Hydrogels Derived from Optimized Acellular Peripheral Nerve*. Society for Biomaterials annual meeting in Denver, CO, April 2014.
13. **Cornelison RC**, Schmidt CE (podium). *Extracellular Matrix Hydrogels Derived from Optimized Acellular Peripheral Nerve*. Pruitt Research Day in Gainesville, FL, November 2013.
14. **Cornelison RC**, Khaing ZK, Schmidt CE (poster). *Injectable Peripheral Nerve Matrix for Spinal Cord Injury Repair*. Neuromuscular Plasticity Symposium in Gainesville, FL, March 2013.
15. **Cornelison RC**, Boder ET (poster). *Trimeric, Activation-Competent Influenza Hemagglutinin via Yeast Surface Display*. Exhibition of Undergraduate Research and Creative Achievements in Knoxville, TN, March 2011.